

# VIRTUAL UTILITY SYSTEM

1/1

100

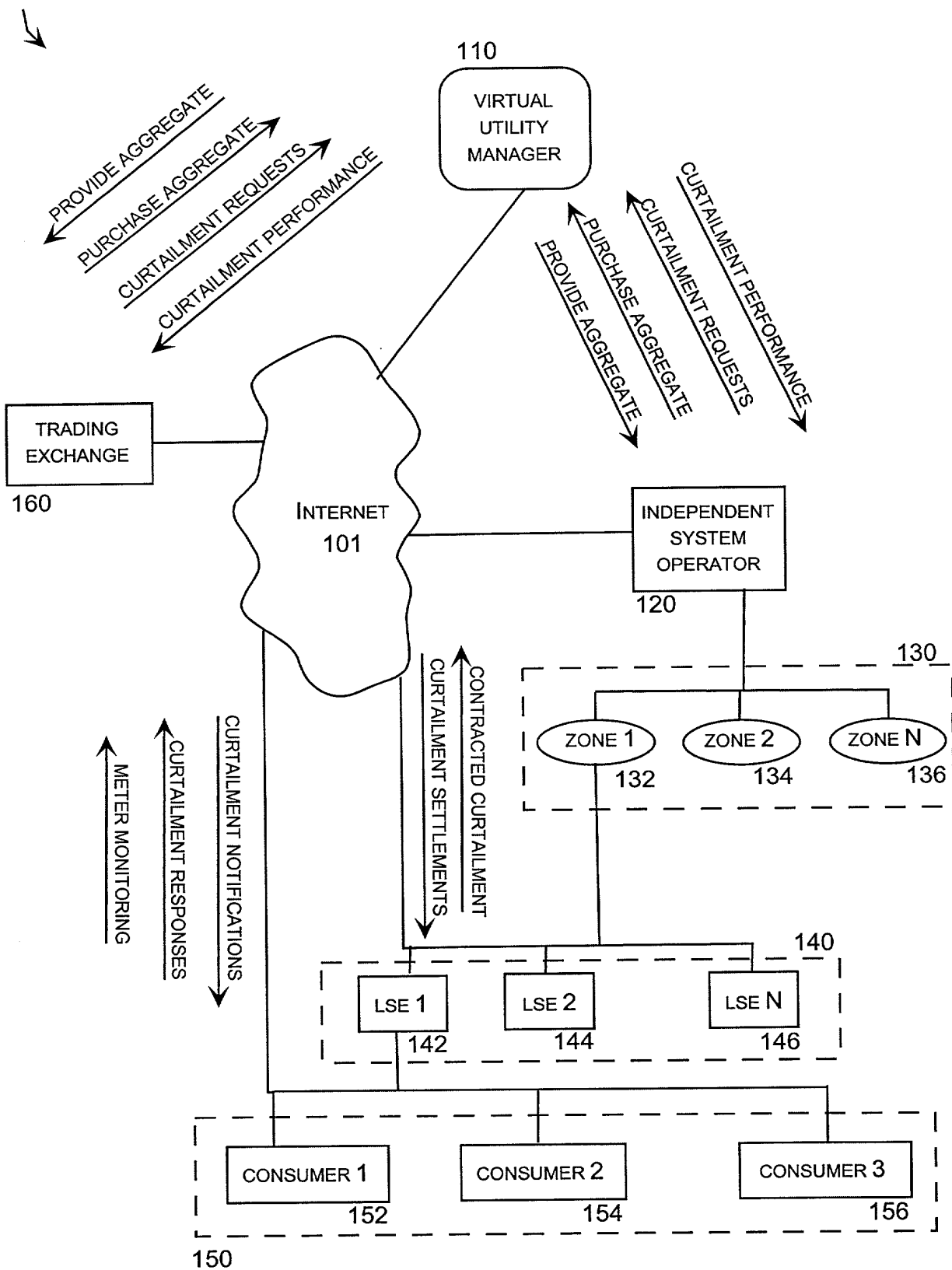


FIG. 1

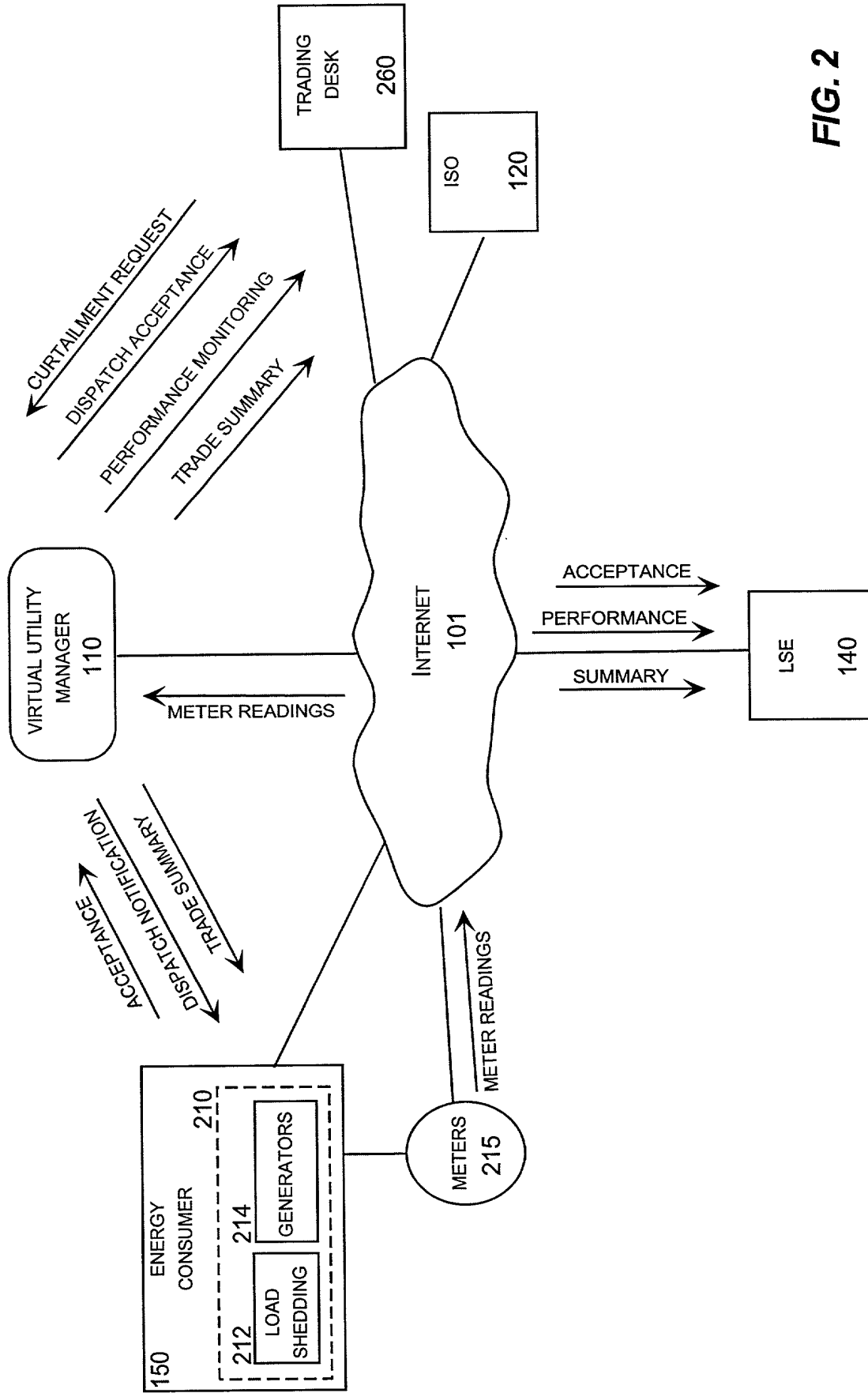
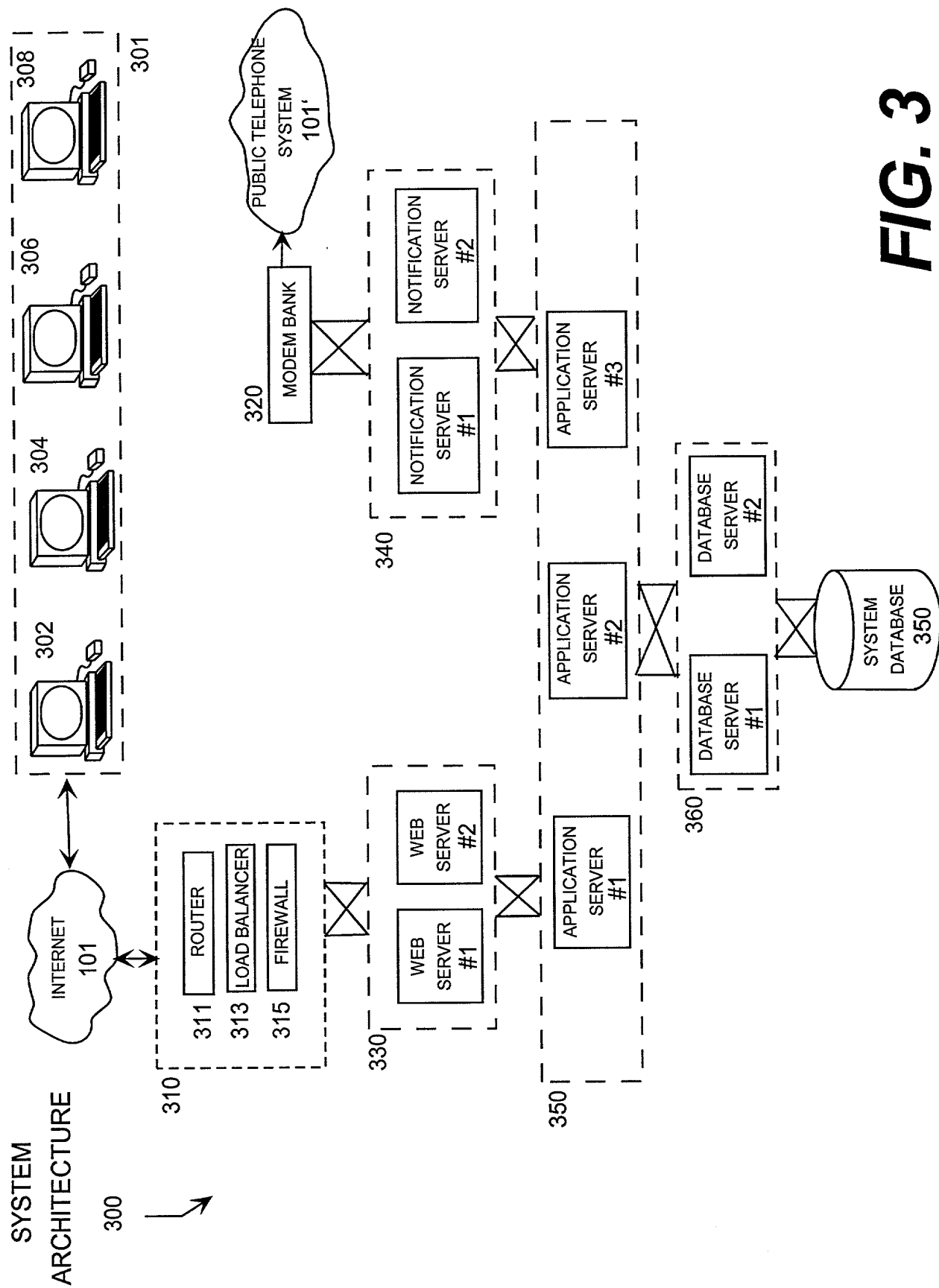


FIG. 2



# FIG. 3

VUM SOFTWARE ARCHITECTURE

4/4

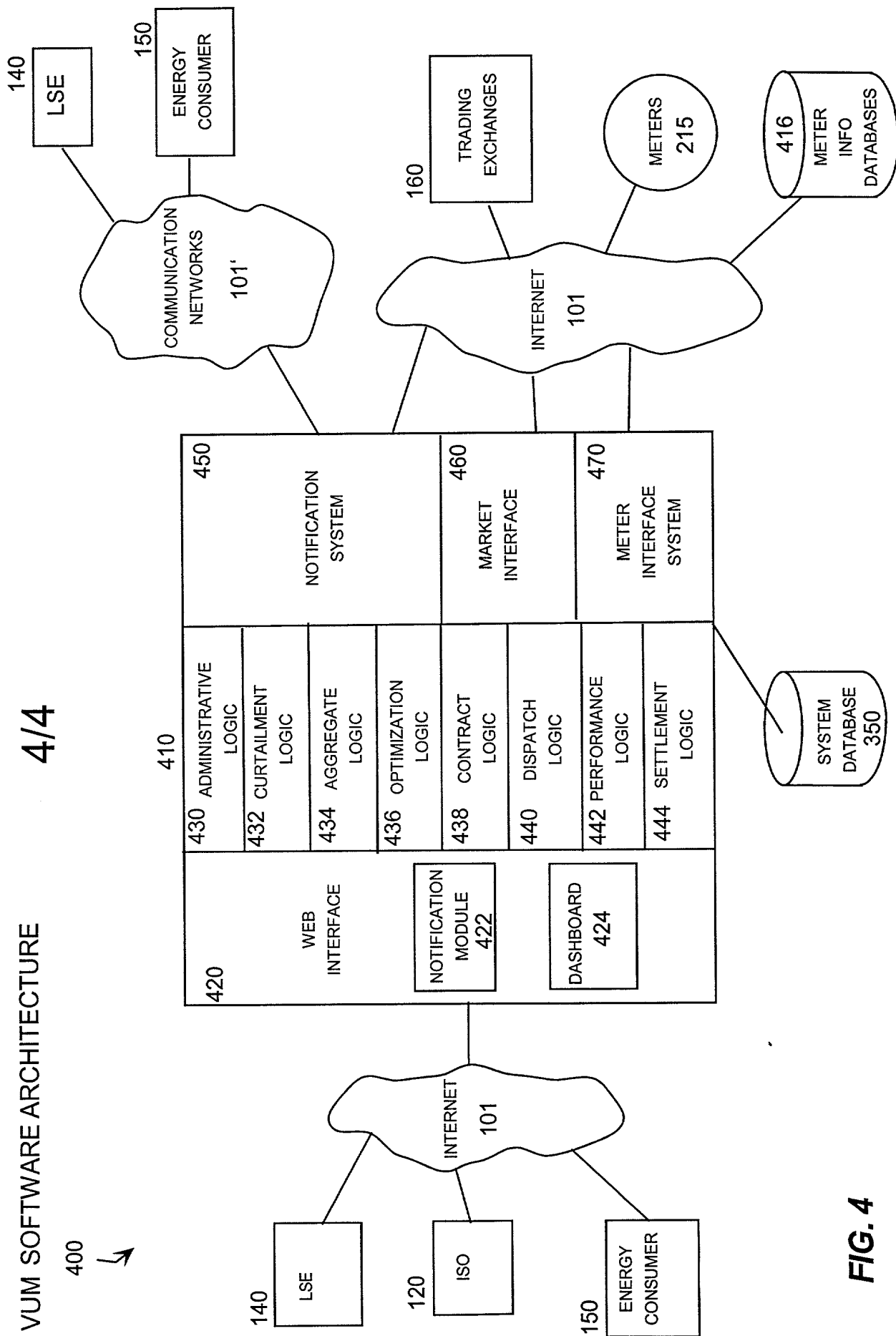


FIG. 4

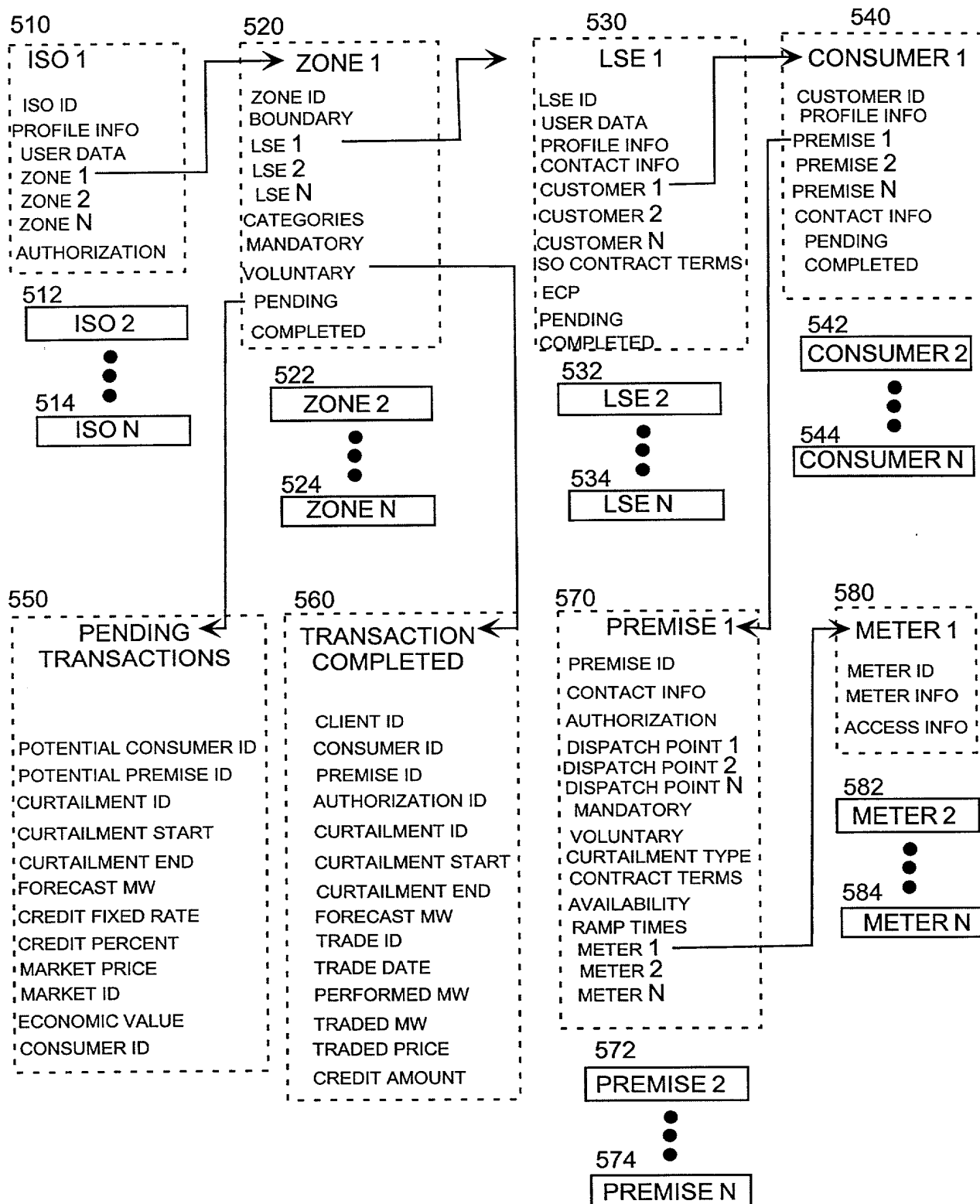


FIG. 5

ISO/VUM

410

<b>NOTIFICATION REQUEST</b>
LSE ID
USER NAME
PASSWORD
LSE ID
PREMISE ID
CURTAILMENT ID
CURTAILMENT PERIOD START
CURTAILMENT PERIOD END
ECP

VUM/ISO

420

<b>CURTAILMENT AVAILABILITY</b>
ZONE ID
PREMISE ID
MANDATORY
VOLUNTARY
ECP
LEAD NOTIFICATION
LOAD SHEDDING
DIESEL GENERATION
AVAILABILITY
PERFORMANCE HISTORY

LSE/VUM

430

<b>AUTHORIZATION</b>
LSE ID
CONSUMER ID
PREMISE ID
USER NAME
USER PASSWORD
CURTAILMENT ID
AUTHORIZATION CODE

VUM/LSE 440

<b>TRANSACTION SUMMARY</b>
LSE ID
CURTAILMENT ID
CONSUMER ID
ACTUAL CURTAILMENT
MW PERFORMED
SETTLEMENT

VUM/CONSUMER 450

<b>NOTIFICATION REQUEST</b>
LSE ID
PREMISE ID
CURTAILMENT ID
CURTAILMENT PERIOD START
CURTAILMENT PERIOD END
RESPONSE TIME
ECP
ESTIMATED REMITTANCE

CONSUMER/VUM

460

<b>AUTHORIZATION</b>
LSE ID
CONSUMER ID
PREMISE ID
CONSUMER USER NAME
CONSUMER USER PASSWORD
CURTAILMENT ID
AUTHORIZATION CODE

METER/VUM

470

<b>METER READINGS</b>
METER ID
DATE
USAGE 1
TIME 1
USAGE 2
TIME 2
USAGE N
TIME N

VUM/METER

480

<b>METER REQUEST</b>
DATA BASE USER ID
DATABASE PASSWORD
METER ID
METER DESTINATION
DATE
TIME FRAME

**FIG. 6**

700

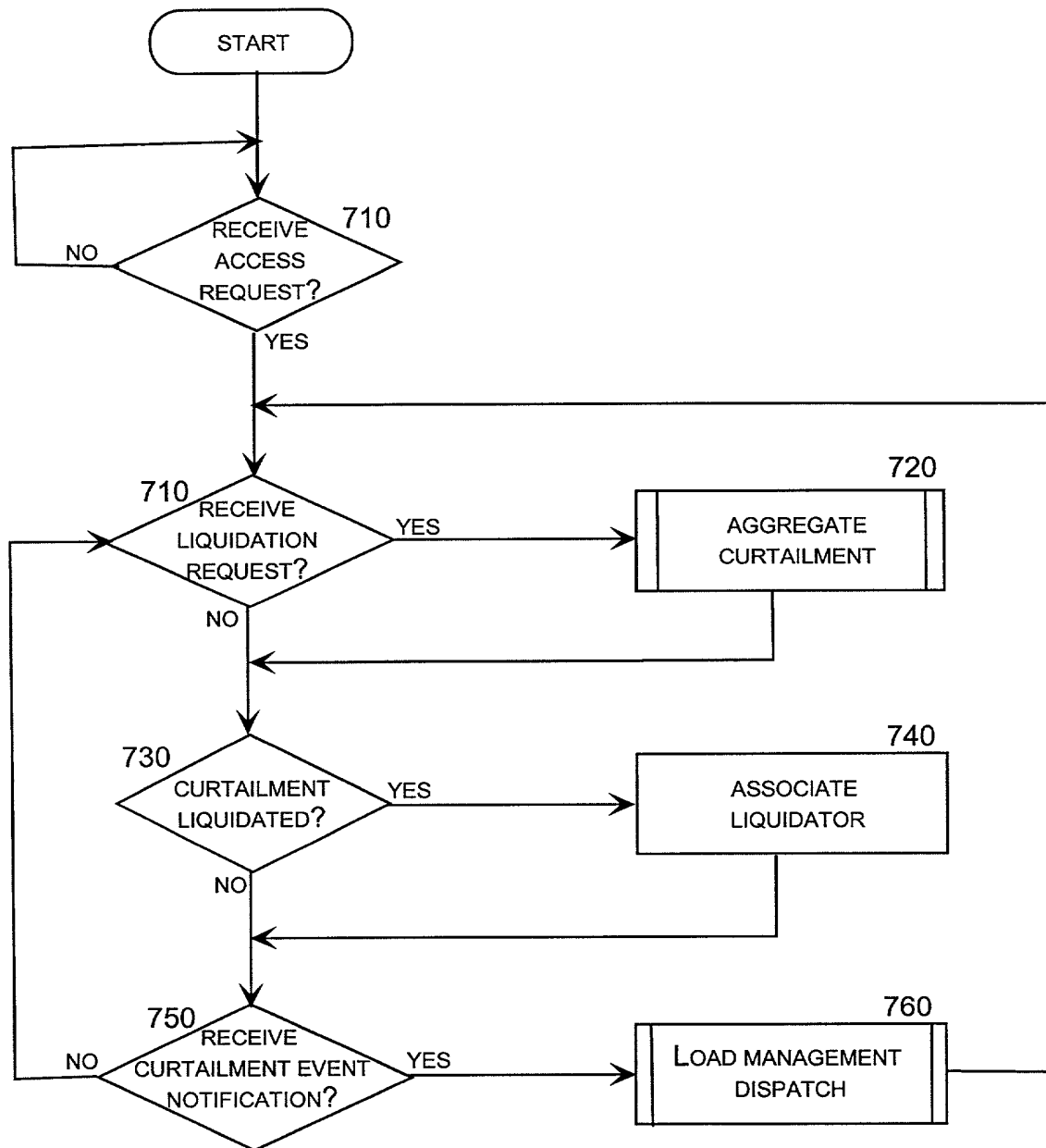
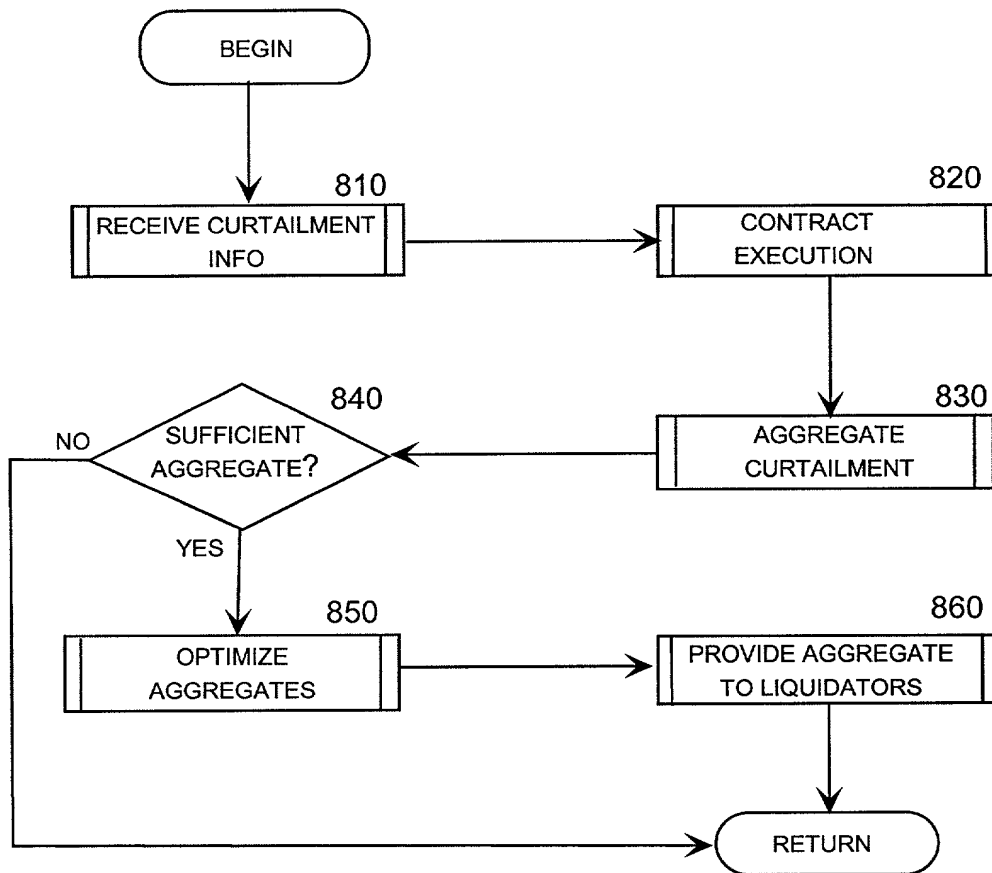


FIG. 7

720



**FIG. 8**



CURTAILMENT INFORMATION  
ROUTINE

9/20

810

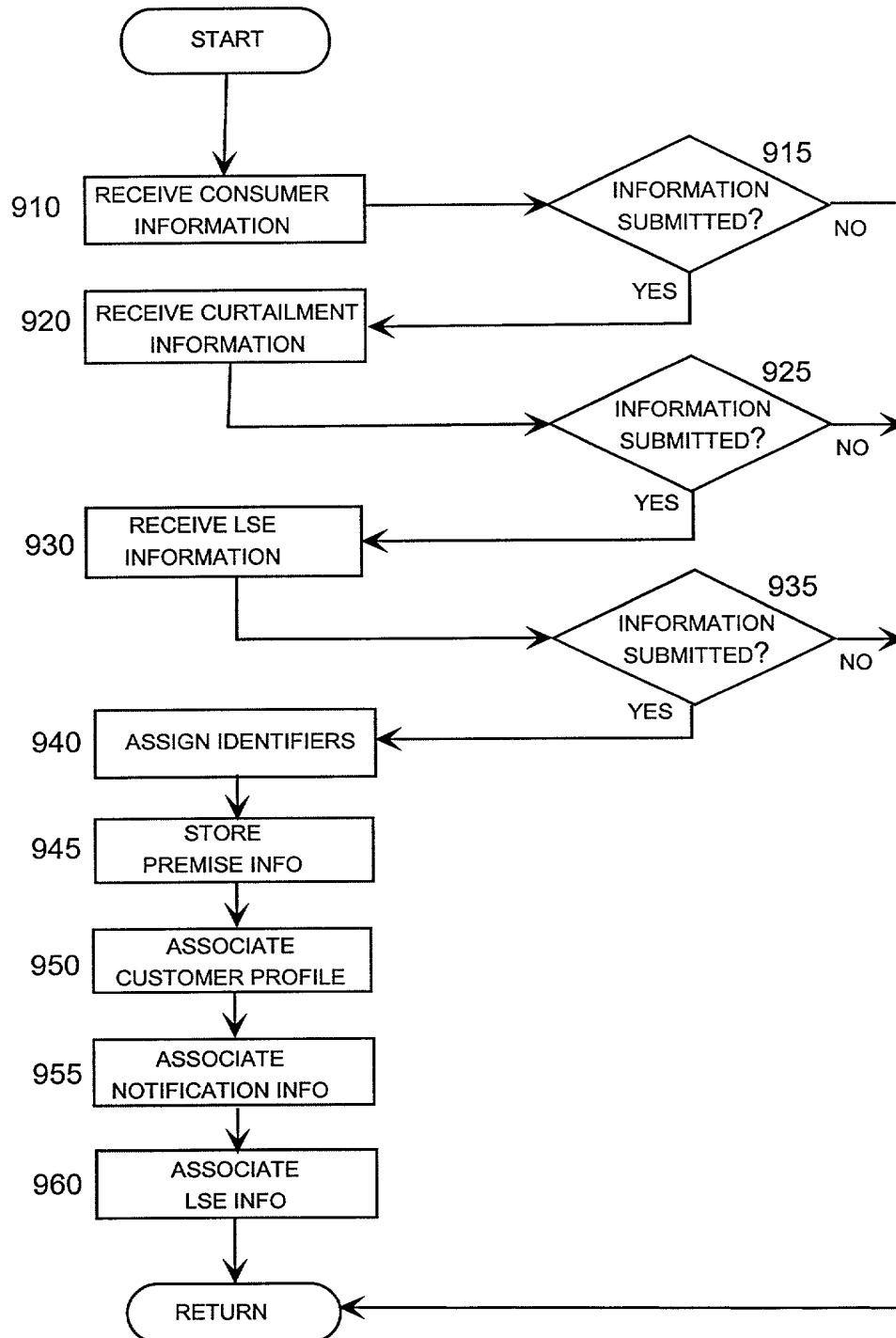


FIG. 9

820  
└─

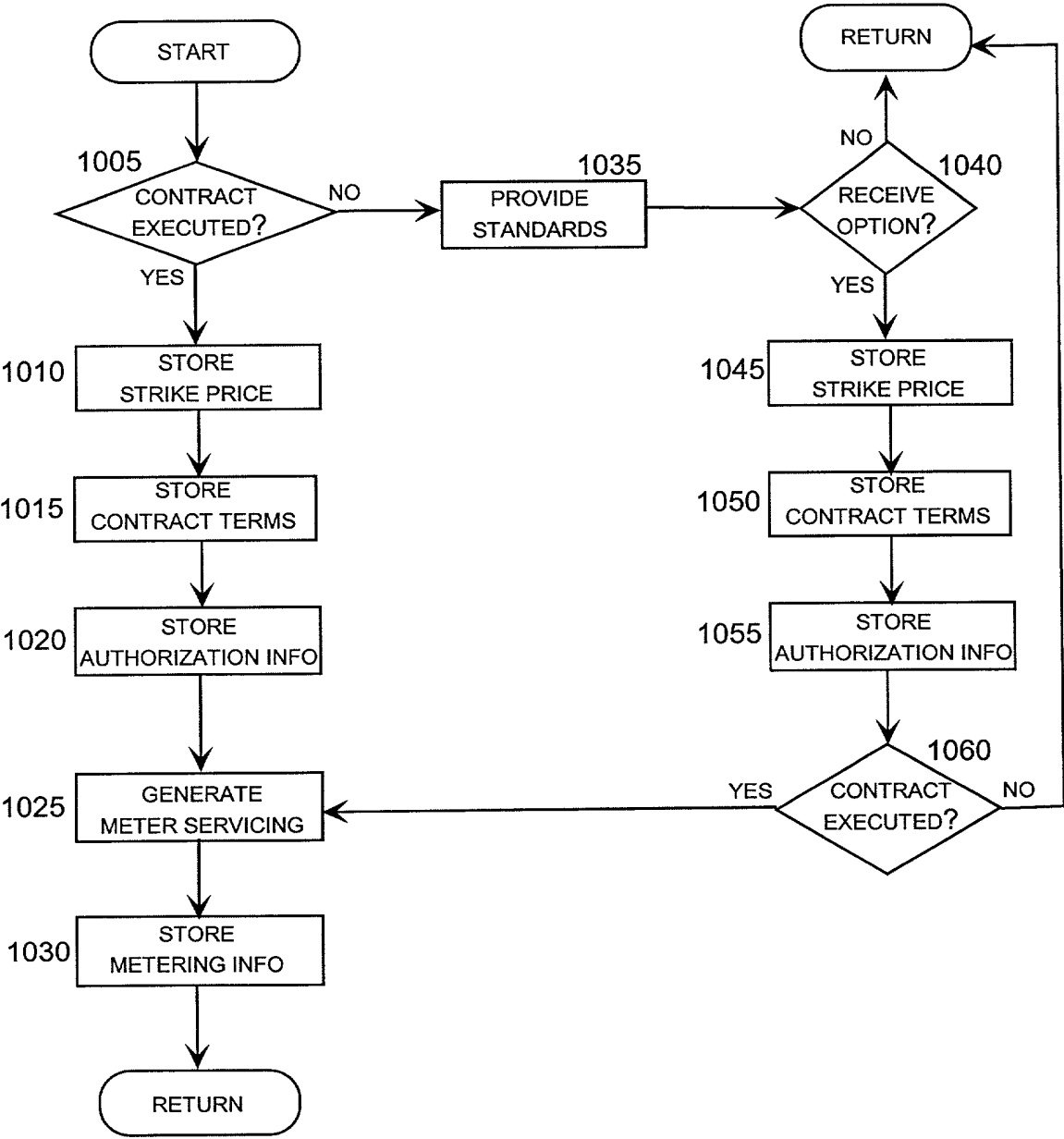
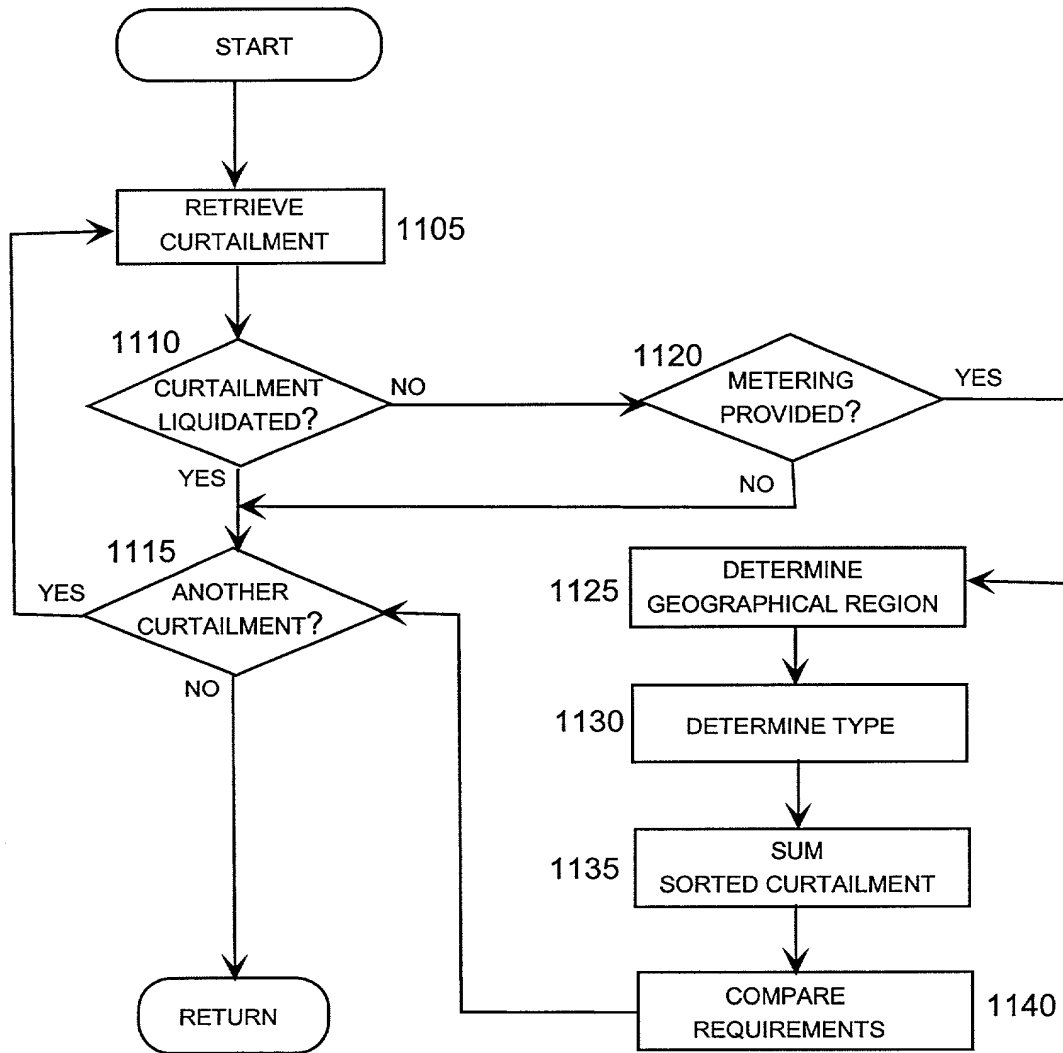


FIG. 10

11/20

CURTAILMENT AGGREGATE  
ROUTINE

830  
↙

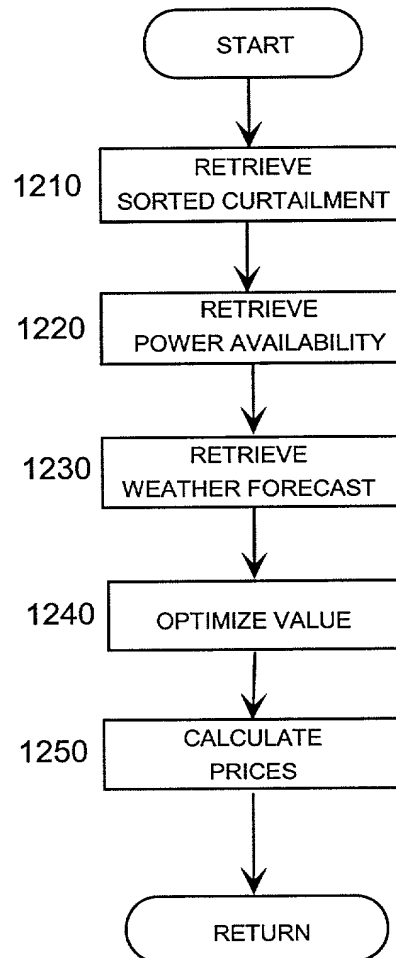


**FIG. 11**

AGGREGATE OPTIMIZATION  
ROUTINE

12/20

850



TOP SECRET 2584560

860  
↓

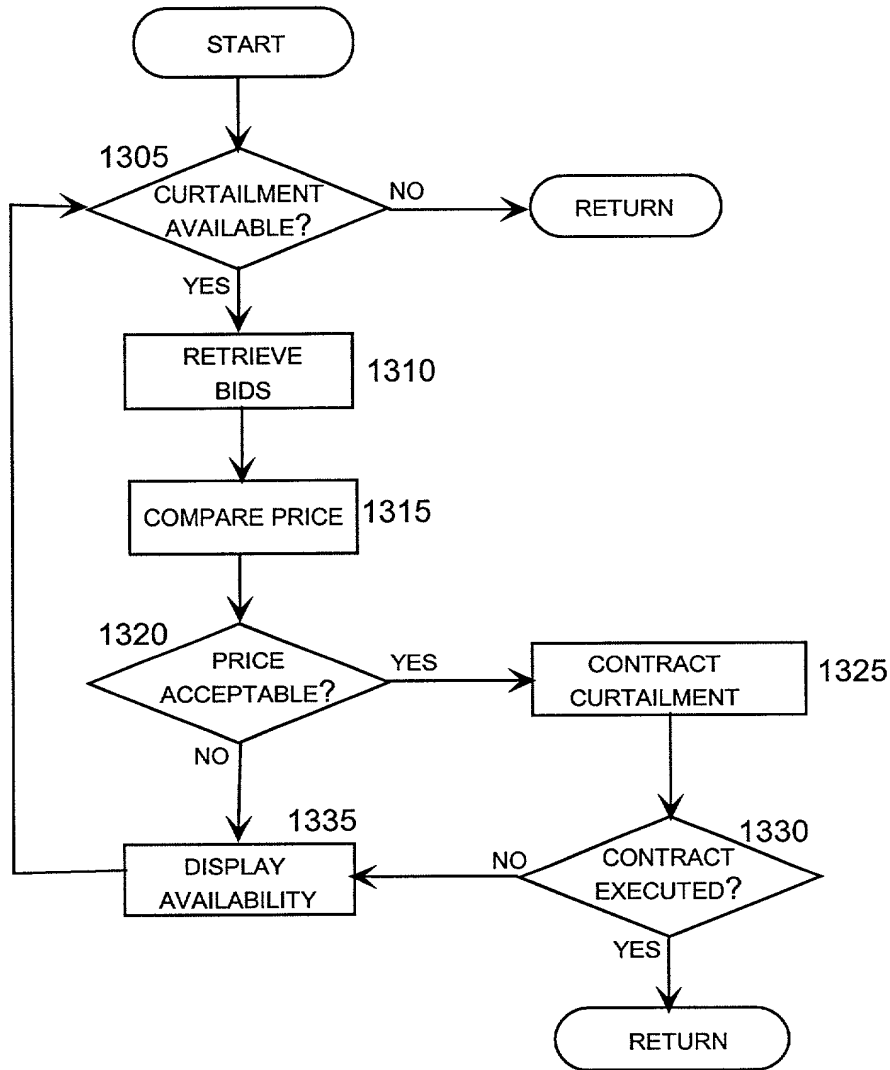
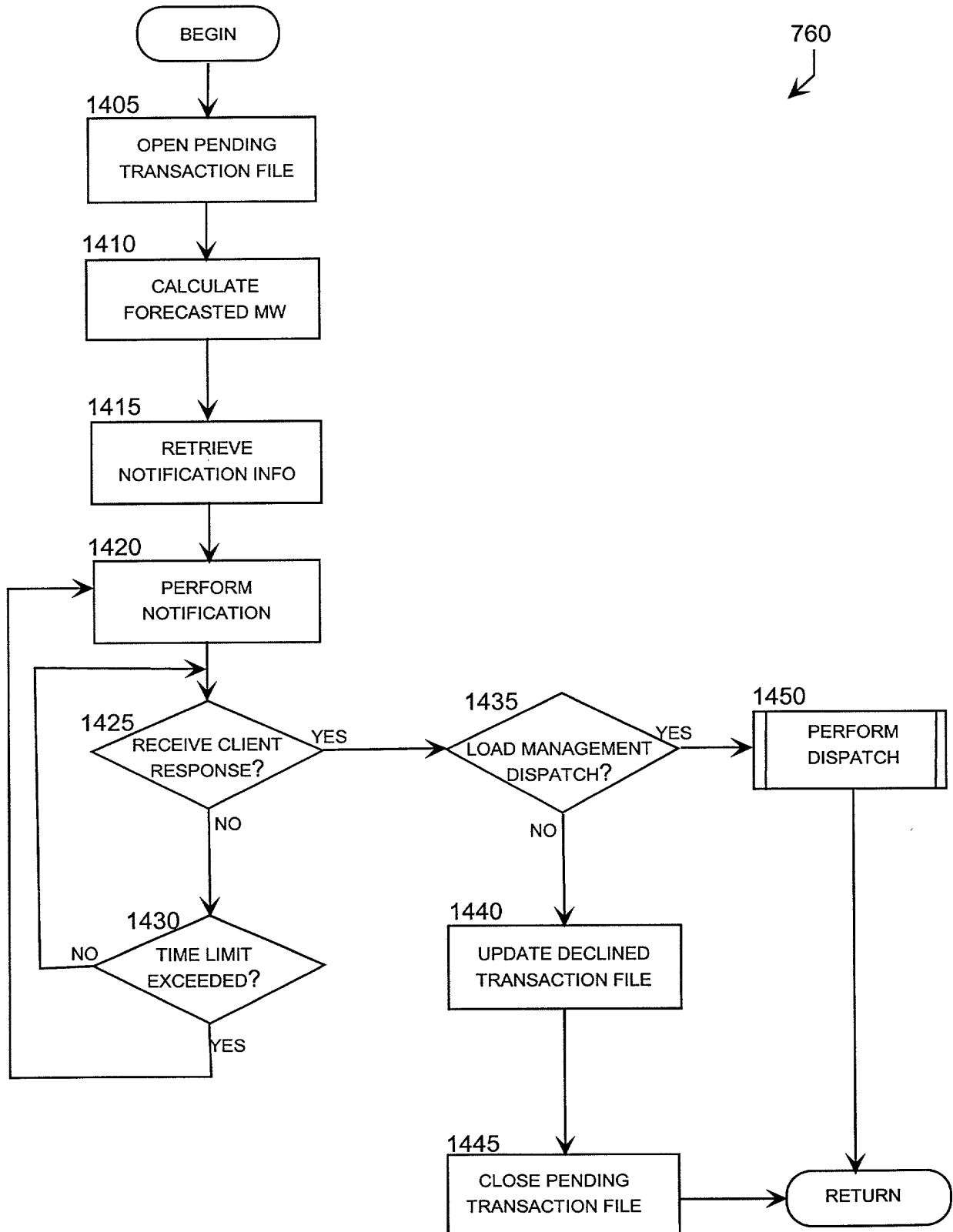


FIG. 13

**FIG. 14**

1450

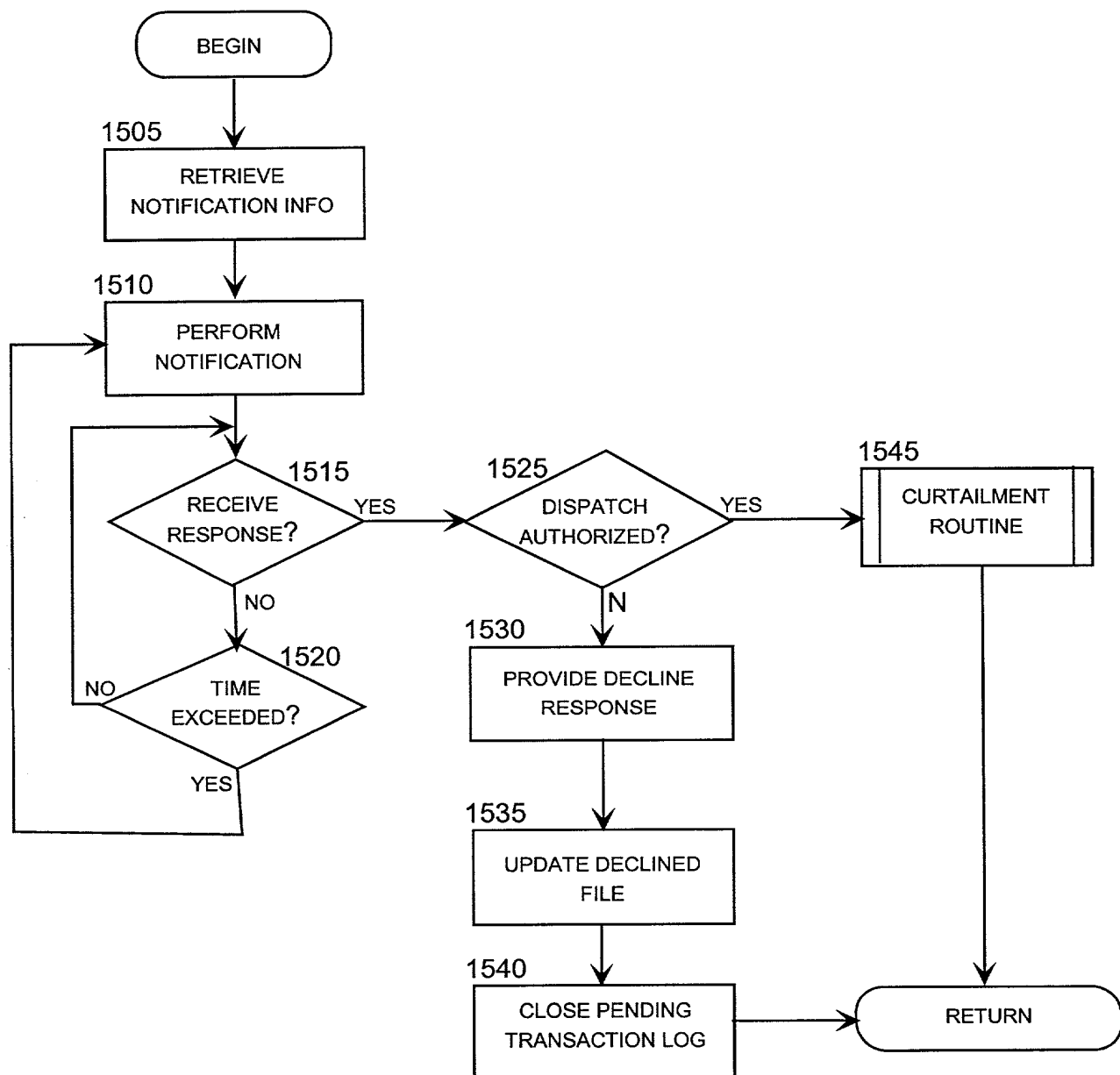


FIG. 15

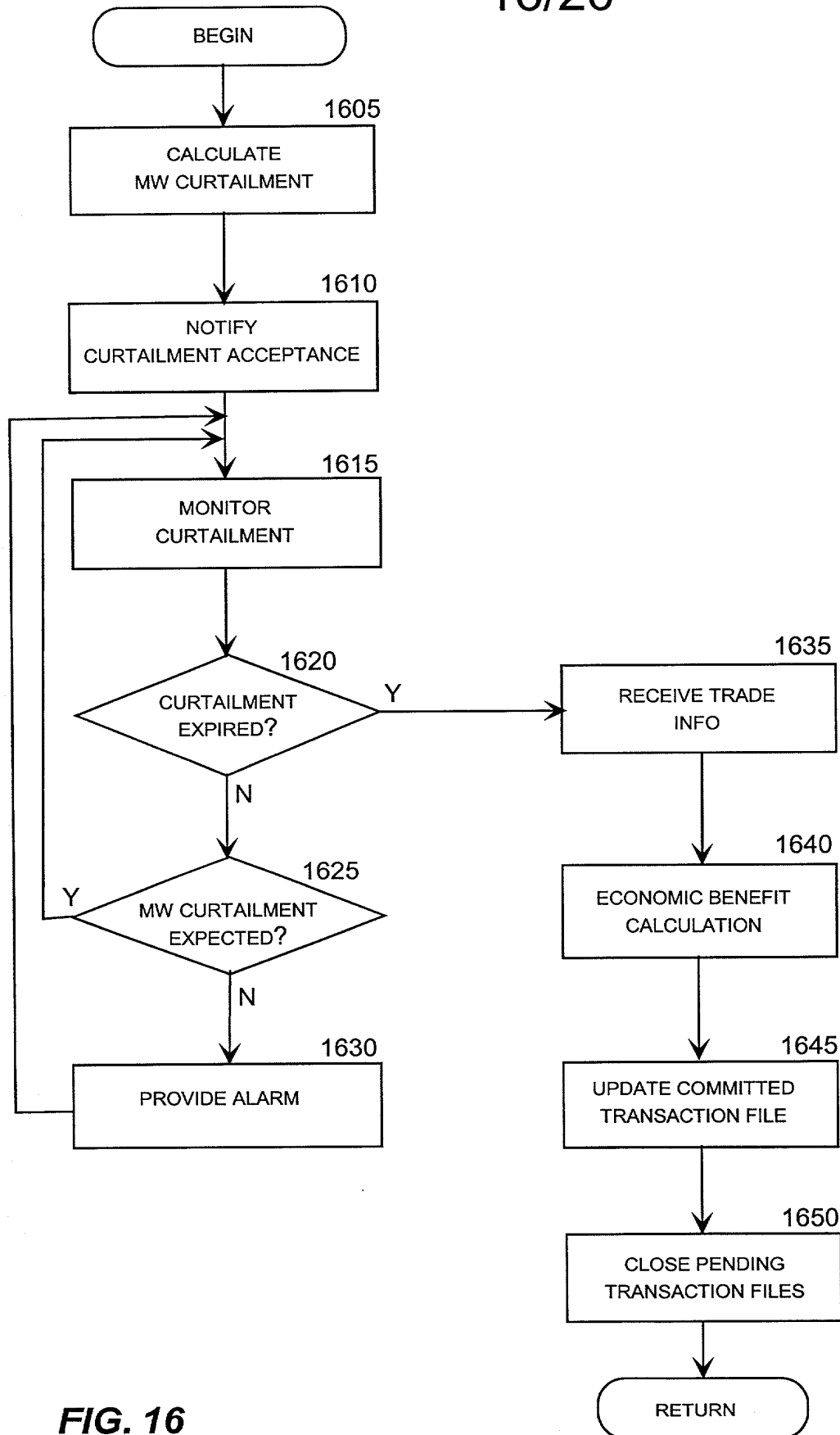


FIG. 16



17/20

1700



FILE	EDIT	VIEW	FAVORITES	TOOLS	HELP
ADDRESS		<input type="text"/> <input type="button" value="GO"/> <input type="button" value="BACK"/> <input type="button" value="FORWARD"/> <input type="button" value="STOP"/> <input type="button" value="REFRESH"/> <input type="button" value="HOME"/>			
ISO LOGO		VIRTUAL UTILITY MANAGER			
		DASHBOARD SUMMARY — 1710			
LOAD CURTAILMENT OPERATIONS					
NOTIFICATION MANAGER					
SYSTEM MESSAGE - SHOW ALL 5/10/2001 8:44 - SYSTEM OK					
PERFORMANCE TOTALS					
MWH CONTRACTED (YTD)		384			
HOURS PERFORMED		0		0	
MW PERFORMED		0		0	
PERFORMANCE MONITOR					
CLASS 1		28.900			
CLASS 2		0.800			
CLASS 1		26.850			
CLASS 2		0.400			
PRICES DISPLAYED FOR THE DATE: THURSDAY, MAY 10, 2001					
1750 PRICING SUMMARY - HISTORY ALARM: \$500.00 — 1760					
HOUR:MINUTE:SECOND		ENERGY		TEN-MINUTE NON-SPINNING RESERVE	
08:54:30		\$57.41		\$0.15	
08:49:31		\$65.78		\$0.15	
08:44:30		\$45.00		\$0.15	
08:39:30		\$45.00		\$0.15	
08:34:30		\$45.00		\$0.15	

FIG. 17

1800

18/20



FILE	EDIT	VIEW	FAVORITES	TOOLS	HELP
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ADDRESS

GO

BACK

FORWARD

STOP

REFRESH

HOME

LOGO

VIRTUAL UTILITY MANAGER

NOTIFICATION MANAGER

1820

1830

1840

1850

1860

1822

1832

1865

NOTIFICATION TYPE

CLASS 1 - CURTAILMENT

PROGRAM

CLASS 1 MANDATORY NEMA/BOSTON

FACILITIES

FIRST CO / MAIN (0.10)

SECOND INC/ MILL (0.75)

THIRD INC/ SERVICE (22.00)

FOURTH CO/ MAIN (2.00)

FIFTH INC (0.30)

TOTAL MW

27.15

CLASS 1 - CURTAILMENT

CURTAILMENT DATE

5/25/01

START TIME

12:40

ESTIMATED END TIME

23:00

CUSTOM MESSAGE

SUBMIT

FIG. 18

19/20



FILE	EDIT	VIEW	FAVORITES	TOOLS	HELP
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ADDRESS

GO

BACK

FORWARD

STOP

REFRESH

HOME

LOGO

VIRTUAL UTILITY MANAGER

NOTIFICATION MANAGER 1910

1920

NOTIFICATION TYPE

CLASS 2 - FORECAST \$100 ECP

1922

1930

PROGRAM

CLASS 2 VOLUNTARY NEMA/BOSTON

1932

1940

FACILITIES

A CO / MAIN (0.10)  
B INC/ MILL (0.20)  
C1 INC/ MAIN (0.10)  
C2 INC/ MAIN (0.10)  
D CORP / MAIN (0.10)  
E INC (0.20)

1950

CLASS 2 - VOLUNTARY

CURTAILMENT DATE  
5/25/01

START TIME  
12:48

ESTIMATED END TIME  
23:00

RESPOND TIME  
12:45

CUSTOM MESSAGE

SUBMIT 1955

TOTAL MW

0.8

1942



20/20

FILE	EDIT	VIEW	FAVORITES	TOOLS	HELP
ADDRESS		<input type="text"/>		<input type="button" value="GO"/>	<input type="button" value="BACK"/> <input type="button" value="FORWARD"/> <input type="button" value="STOP"/> <input type="button" value="REFRESH"/> <input type="button" value="HOME"/>
LOGO		VIRTUAL UTILITY MANAGER			
NOTIFICATION MANAGER - 2010					
2020					
NOTIFICATION TYPE					
CLASS 1 - RESTORATION <input type="button" value="v"/>					
2030					
PROGRAM					
CLASS 1 RESTORATION NEMA/BOSTON <input type="button" value="v"/>					
2040					
FACILITIES					
FIRST CO / MAIN (0.10) SECOND INC/ MILL (0.75) THIRD INC/ SERVICE (22.00) FOURTH CO/ MAIN (2.00) FOURTH CO/ REMOTE (2.00) FIFTH INC (0.30)					
TOTAL MW <input type="text" value="27.15"/> 2045					
CURTAILMENT EVENT #262 - CLASS 1 MANDATORY - 05/25/01					
NEW END TIME		<input type="text" value="16:00"/>		2050	
CUSTOM MESSAGE					
<input type="button" value="SUBMIT"/> 2055					